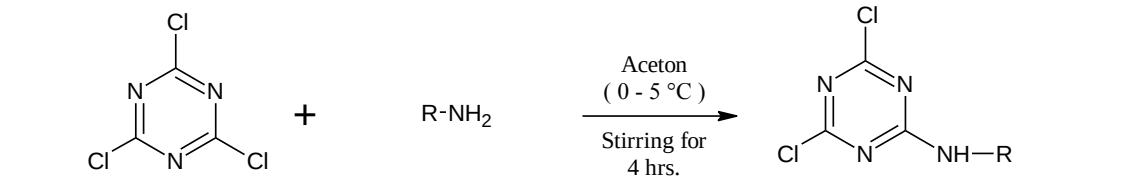
Work Plan and Methodology:-

Research Methodology:-

Reaction scheme - I 1.1

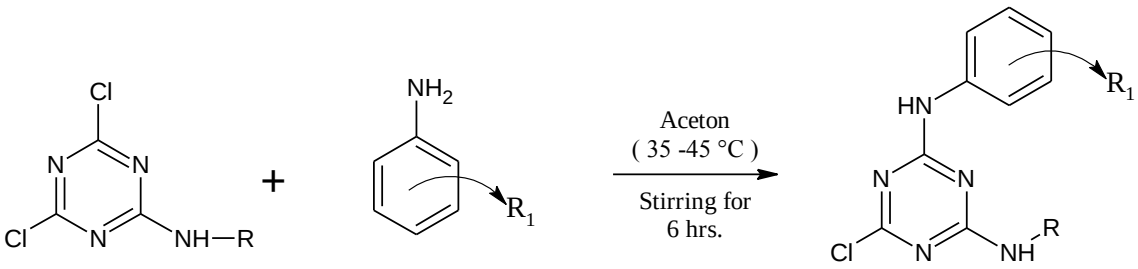
I[st] STEP:



2,4,6-trichloro-1,3,5-triazine (cyanuric chloride) | Primary amine (Nucleophilic reagent) | 4-substitutedamino-2,6-dichloro-1,3,5-triazine

Where **R** = ethyl, propyl, butyl, diethyl, ter. butyl etc.

II[nd] STEP:

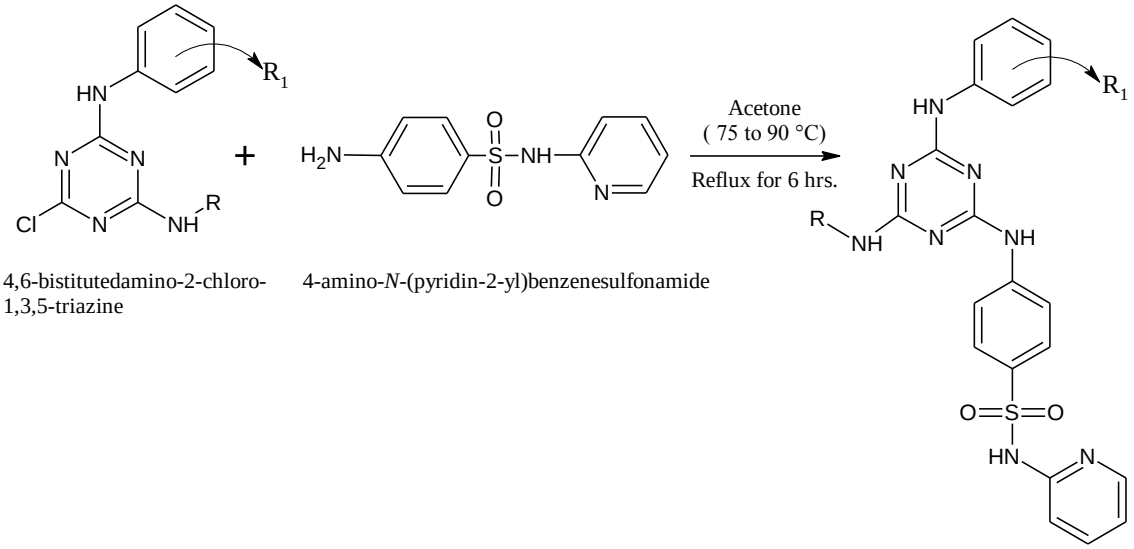


Primary amine (Nucleophilic reagent)

4,6-bistitutedamino-2-chloro-1,3,5-triazine

Where $\mathbf{R_1}$ = -H, $-CH_3$, $-OCH_3$, $-NO_2$, -Cl

Reaction scheme - II 2.1

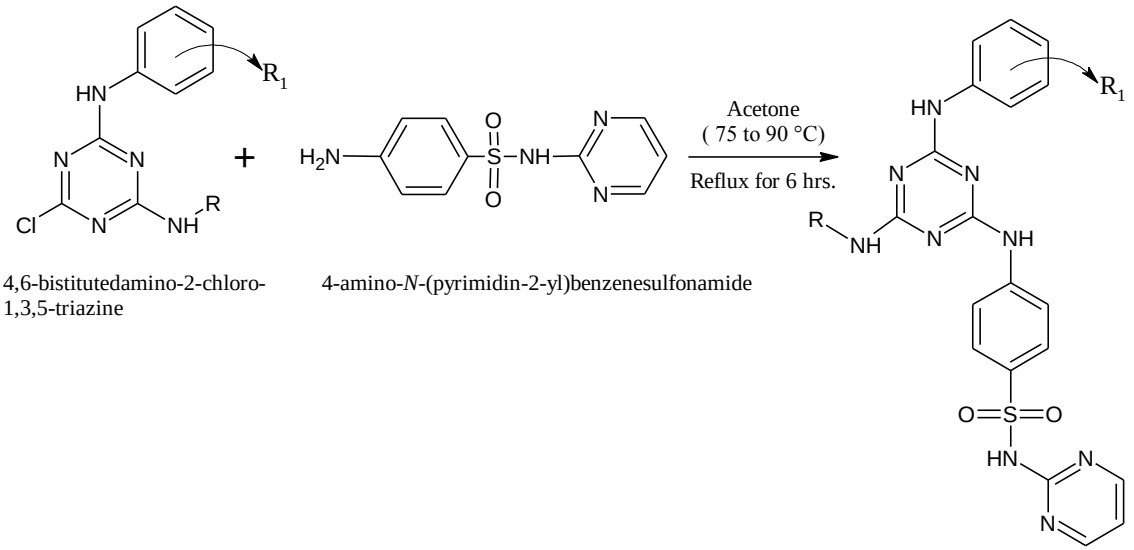


4,6-bistitutedamino-2-chloro-1,3,5-triazine

4-amino-*N*-(pyridin-2-yl)benzenesulfonamide

(I)

Reaction scheme - II 2.2

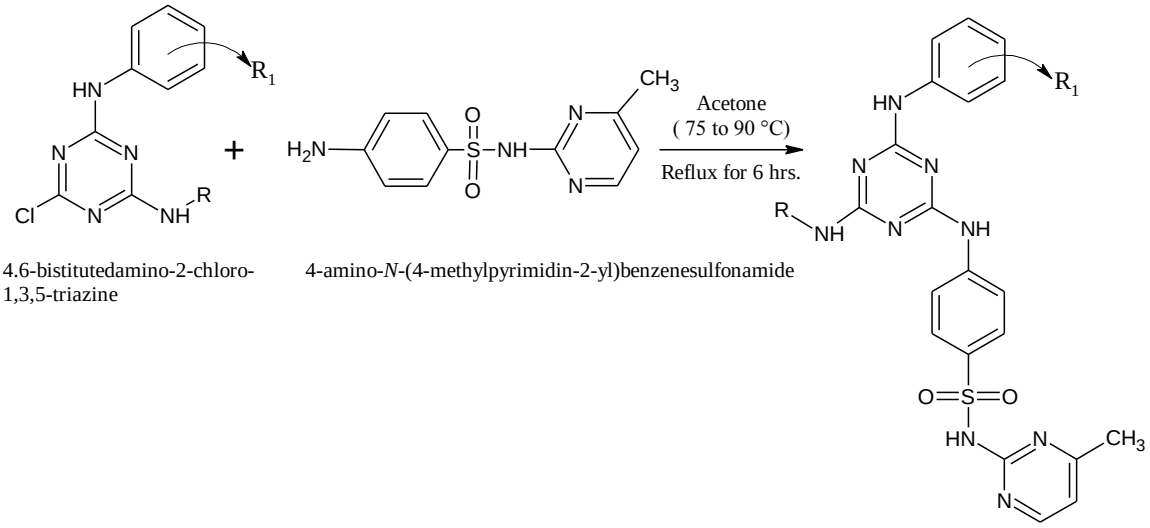


4,6-bistitutedamino-2-chloro-1,3,5-triazine

4-amino-*N*-(pyrimidin-2-yl)benzenesulfonamide

(II)

Reaction scheme - II 2.3

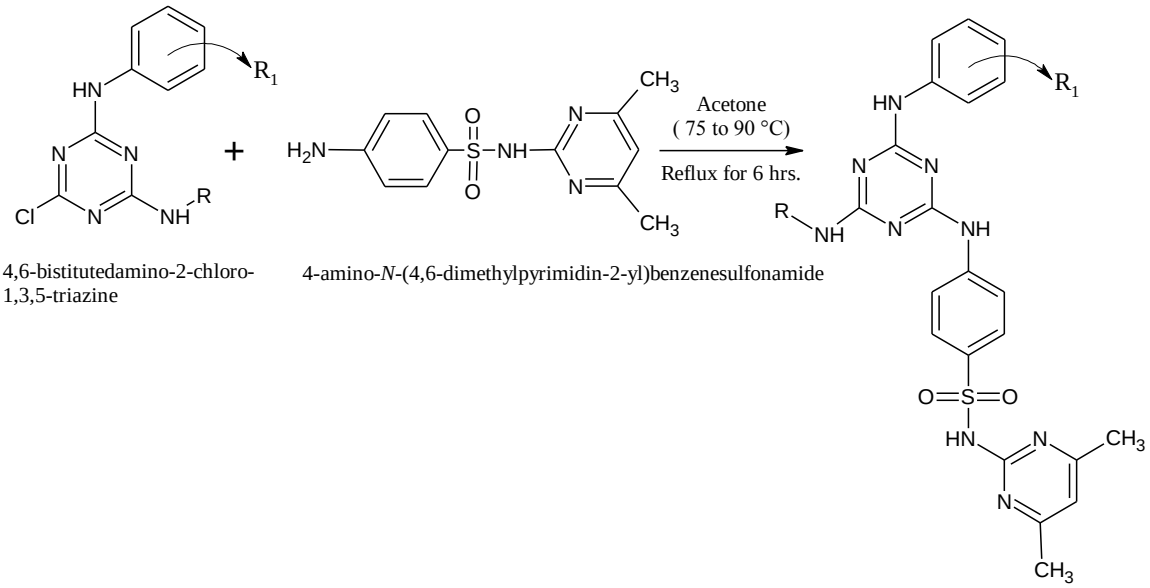


4.6-bistitutedamino-2-chloro-1,3,5-triazine

4-amino-*N*-(4-methylpyrimidin-2-yl)benzenesulfonamide

(III)

Reaction scheme - II 2.4

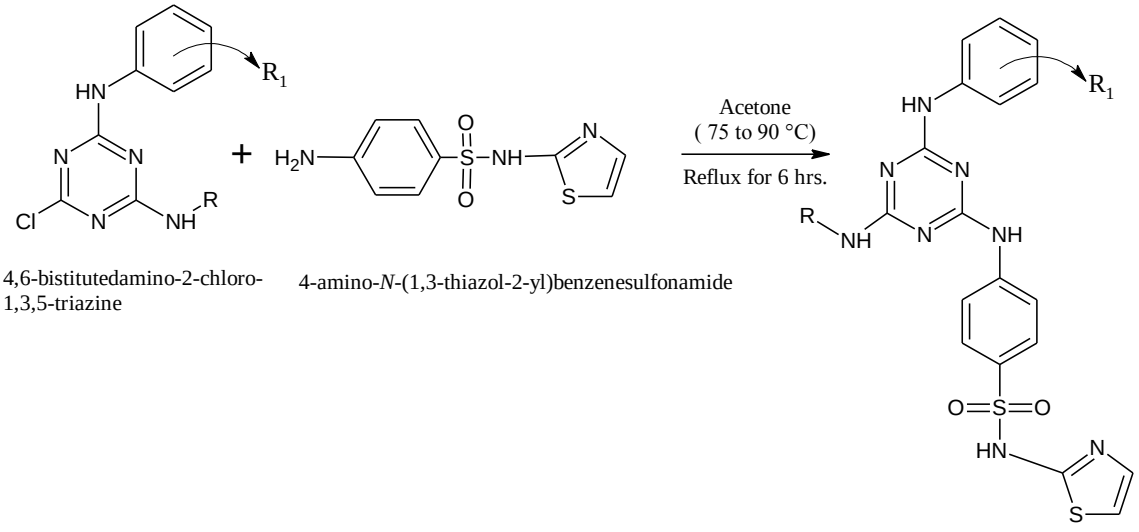


4,6-bistitutedamino-2-chloro-1,3,5-triazine

4-amino-*N*-(4,6-dimethylpyrimidin-2-yl)benzenesulfonamide

(IV)

Reaction scheme - II 2.5



4,6-bistitutedamino-2-chloro-1,3,5-triazine

4-amino-*N*-(1,3-thiazol-2-yl)benzenesulfonamide

(V)

Work Plan :-

Different research designs will be surveyed by literature. I will go through the literature pertinent to organic s-triazine and sulfa drugs derivatives in chemical abstract, recent books, e-books and latest industrial products. Looking to the advantages of renewable source of organic compounds, the research topic will chose. The internet system would be surf for the latest technological development of antibacterial and antifungal agent.

With the above aim the following work has been planned for the Ph.D. research work.
General synthesis of following derivatives:

I. 4-(4-(substitutedamino)-6-(substitutedphenylamino)-1,3,5-triazine-2-ylamino-N-(pyridine-2-yl)benzenesulfonamide derivatives.
II. 4-(4-(substitutedamino)-6-(substitutedphenylamino)-1,3,5-triazine-2-ylamino-N-(pyrimidin-2-yl)benzenesulfonamide derivatives.
III. 4-(4-(substitutedamino)-6-(substitutedphenylamino)-1,3,5-triazine-2-ylamino-N-(4-methylpyrimidin-2-yl)benzenesulfonamide derivatives.
IV. 4-(4-substitutedamino)-6-(substitutedphenylamino)-1,3,5-triazine-2-ylamino-N-(4,6-dimethylpyrimidin-2yl)-benzenesulfonamide derivatives.
V. 4-(4-(substitutedamino)-6-(substitutedphenylamino)-1,3,5-triazine-2-ylamino-N-(thiozol-2-yl)benzenesulfonamide derivatives.

Techniques used for characterization:

Following method will be used for analysis

a. C, H, N, S elemental analysis
b. Infrared spectroscopy.
c. The ^{1}H NMR spectroscopy.
d. C^{13} NMR spectroscopy.

- **Antibacterial and Antifungal activity :**

  Antibacterial activity: Antibacterial activities of all the newly synthesized compounds will be studied against Gram-positive bacteria and Gram-negative bacteria by agar cup plate method. The area of inhibition zone will be measured in mm.

  Antifungal activity: All the newly synthesized compounds will also be screened for their antifungal activity against using the agar cup plate diffusion method by dissolving in DMF at a concentration of 100 μg/ml. The zone of inhibition will be measured after 7 days at 20ºC

  Work plan:

  Year-wise Plan of work and targets to be achieves.

  First-Year:

- In first six month planning for literature survey
- Synthesis of various novel derivatives containing sulfa drugs.
- To elucidate structure of newly synthesized derivatives by Infra- red, Nuclear magnetic

  resonance spectra and elemental analysis.

  Second-Year:

- Investigation of antimicrobial (Anti-bacterial, Antifungal etc.) activity.
- Publication/Presentation of Research work.
- Preparation of Thesis work.
- The work will be carried out and distributed into six chapters of the proposed thesis.